Chapter 3. Transforming Baja California into a Dirty Energy Zone

Hoping to avoid strict environmental laws and local opposition to coastal development in California, yet still have easy access to the United States, corporations like Sempra, Shell, ChevronTexaco, Marathon and ConocoPhillips proposed LNG terminals on the Baja California coast, just South of the California border. The first proposed projects, which were inappropriately located in residential neighborhoods, were driven away by local residents who feared for the safety of their families. However, two environmentally and socially flawed projects remain on the Baja California coast.

Secret deal hands Coronado Islands to Chevron-Texaco

In order to build the proposed LNG terminal at the Coronado Islands site, Chevron-Texaco had to secure a concession, or a right to use public assets, from the Mexican federal government. The Ministry of Communications and Transport (SCT) is the branch of the government responsible for issuing concessions. The SCT and Chevron-Texaco quietly negotiated a deal to hand over control of the Coronado Islands to the multinational corporation for 30 years. The SCT announced that the solicitation for a concession for the use of federal waters would be made on December 8, 2003. However, the notice was not published until December 29, 2003, a time when the public would pay little attention to the announcement.[1]

The information regarding the concession did not appear in any of the expected locations. It was not published on the web page of the SCT or the standard public website of the Interior Ministry, which is a violation of the Federal Law of Transparency and Access to Governmental Public Information.

The delayed release of the announcement that a solicitation for a concession to use public assets was timed to correspond with the holiday season in Mexico. The notice specified that parties interested in the concession must express interest before January 12, 2004. Mexico was on holiday until January 5, leaving one week for an interested party to obtain, complete and deliver the necessary documents. If these documents were not delivered by 2 PM on January 12, 2004, the interested party was not able to participate in the upcoming tender.[2]

The timing of the release, and the lack of publication of the document on readily accessible sites, demonstrate a lack of transparency in the negotiation of the tender, and the subsequent granting of exclusive rights to use the Coronado Island site for 30 years to Chevron-Texaco.

The exceptional conservation value of these islands has been recognized by the Mexican Federal Congress, which exhorted the relevant Federal agencies to create a natural protected area for the Baja California Pacific islands, including the Coronado Islands, as well as San Benito, Cedros, Guadalupe, San Martín, San Jerónimo, and Todos Santos (Congreso de la Unión 2003) on July 23, 2003.

Shell has misrepresented their intentions in the past

In May 2003, the Border Power Plant Working Group (BPPWG) used the courtroom to highlight the unfair practices of California's Sempra Energy and InterGen, a power generation venture of Shell. Sempra and Shell were in the process of constructing transmission lines to connect power plants just across the border to United States' markets. The BPPWG filed suit against the Department of Energy (DOE), as the DOE granted the permits necessary to import power to the U.S. along the transmission lines. Federal Judge Irma Gonzalez initially appeared to set higher pollution reduction standards for the region. However, she eventually ruled in favor of the DOE after taking into consideration the economic impacts of shutting down the plants.

Shell had agreed to install smog reducing Selective Catalytic Reduction (SCR) technology, considered to be Best Available Control Technology (BACT), on its two export turbines by the time of commercial startup in June 2003. The company was initially unwilling to install BACT on the two remaining turbines supplying power to Mexico. Pressure from citizens, local government, and California federal politicians ultimately forced InterGen to capitulate and agree to install SCR on the two domestic turbines as well.[3]

Despite their written commitment, InterGen did not install SCR on one of the export turbines before startup in June 2003. The plant operated without control from the summer 2003 through January 2004. One reason that Judge Gonzalez did not shut down the power plants during the remedy phase of the court case was InterGen's insistence that its plant's emissions would be controlled to less than significant levels through the use of SCR.

Shell – as InterGen – misrepresented itself to the court, the DOE, and to the community, which was directly impacted by the unexpectedly high emission levels. Although the failure of Intergen to install SCR was pointed out to the DOE by the Border Power Plant Working Group in November 2003, InterGen continued to operate the affected turbine until January 2004. The company agreed to stop operating the turbine only in response to a threat of a complete shutdown by the DOE.[4] As a result of this "breach of faith," Senator Diane Feinstein of California negotiated an accelerated SCR installation schedule for the remaining two Intergen turbines in January 2004. The initial spring 2006 SCR installation target date has been advanced to the spring of 2005.

Violation of the Constitution

According to a group of Mexican Federal legislators and local activist groups, the proposed LNG terminals in Baja California and the Coronado Islands also violate the Mexican Constitution. Their argument stems from Article 27 of the Mexican Constitution, which states:

> Ownership of the lands and waters within the boundaries of Mexico belong to the State, and the State has direct ownership of all natural resources including petroleum and all solid, liquid and gaseous

> hydrocarbons. No petroleum or hydrocarbon concessions may be granted, and the State must manage the exploration and development of such products in accordance with terms established in the regulatory law.[5]

The independence of Mexican oil and gas from foreign interests has been a matter of national pride since 1938 when the company Petroleos Mexicanos was created.[6]

According to the legislators, President Vicente Fox attempted to sidestep the Mexican Constitution in order to open the energy sector to private investors. However, the legislators filed a constitutional challenge in the Supreme Court on July 4, 2001. The legislators claimed that President Fox announced an amendment to the Constitution that would allow for increased investment by the private sector. Proposing an amendment to the Constitution is a function reserved exclusively for the Congress. The Mexican Supreme Court ruled against President Fox's changes on February 26, 2004. The Supreme Court declared "that President Vicente Fox had overstepped his authority in raising the amount of power that the Federal Electricity Commission could buy from private companies that generate more than they need to fuel their own operations."[7]

Legal battle over environmental permits for Sempra LNG terminal

Fifteen lawsuits that challenge environmental permits issued to Shell/Sempra have been filed in Mexican Courts. The flood of lawsuits caused a temporary injunction against the permit to be issued in November of 2003.[8] The injunctions were lifted in March 2004 when the Mexican City courts declared that the suits had merit. Although Shell/Sempra now claim that they are moving ahead "in full force and effect",[9] the removal of the injunction actually indicates that the lawsuits are proceeding within the Mexican Court System. Shell/Sempra's claims that the legal problems have been completely resolved may be designed to reassure investors.

The LNG terminals do not help the local economy in the long-term

The LNG terminal proposed by Shell/Sempra will require 1,000 workers during the construction phase. This phase is expected to last 40 months. When construction is completed, the LNG terminals will employ between 30 and 40 technical workers.[10] It is unclear if these workers will be from the local community or not, but as the job requires specific technical skills, it is expected that the company will bring workers in from other locations who have already completed the necessary training.

Chevron-Texaco plans on employing 1,200 construction workers during the construction phase. The estimated number of local jobs that will be indirectly created is 2,400. Chevron-Texaco does not further articulate how these jobs will be created. However, the Chevron-Texaco and Shell/Sempra terminals are similar in size and employment expectations are similar.

Chevron-Texaco claims that placing an LNG regasification terminal in Mexico will move Mexico from the end of the natural gas supply chain to the beginning. However, Mexico

is really being placed near the end of one of the longest supply chains in history. It will take 18 days for LNG from Chevron-Texaco's proposed LNG liquefaction site in Australia to reach the West Coast of Mexico.[11] Importing LNG from the proposed Sakhalin Island site in the Russian Far East will take a minimum of 11 days one-way.[12] The amount of CO_2 emitted during the transportation process increases with the length of the voyage. Despite Chevron-Texaco's claim, Mexico is not being moved to the beginning of the supply chain, and it is not moving in the direction of energy independence as this implies.

The LNG terminal is bad for the economy in Baja California

The economy in Baja California relies heavily on tourism, and the importance of tourism to the area is growing steadily. In 2003, almost three billion U.S dollars were generated from Baja California travel and tourism, and that amount is growing at a rate of 6.7 percent annually.[13] Strong growth in this sector is expected to continue and increase because of investments being made in the area. The tourism sector is critical to Mexico, as the factory jobs that Mexico depends heavily upon are being moved to countries with cheaper labor. While Baja California has not lost many jobs at the border assembly plants to lower cost labor abroad, the tourism industry is seen as an essential means of stabilizing the economic situation in the state.[14]

The tourism industry is largely focused on expanding ecotourism. To that end, the state government created a series of ecotourism circuits in each of the six major regions of Baja California. These ecotourism circuits take tourists through historic missions, natural hot springs, cave paintings and archaeological sites. More traditional tourism is still based almost entirely on the natural surroundings of the area. Activities include seaside spas, wilderness and beach camping, deep-sea fishing, beach horseback riding, golf, kayaking, hiking, scuba diving and sailing.[15]

The ecotourism industry is a major driving force in the economy of Baja California. The proposed LNG terminals on the coastline and the Coronado Islands will introduce unsightly terminals and tankers to the area, hampering the tourism industry. The tourism industry requires both skilled and unskilled labor and provides many job opportunities. The LNG terminals will reduce the number of tourism related jobs and will create very few local jobs.

Sempra/Shell terminal jeopardizes Bajamar Resort

A popular tourist resort, Bajamar, is located within 2 miles of the LNG terminal proposed by Shell and Sempra. Developer Roberto Valdes spoke out against the LNG terminal, "I think Ensenada city and state government officials need to put a hold on the project and consider if it is wise to jeopardize the safety and peace of mind of people who are living and investing in the Bajamar resort".[16] Valdes is especially concerned because the recent explosion at an LNG facility in Algeria caused damage up to seven miles away. An accident of similar magnitude at the Sempra/Shell LNG terminal would put Bajamar residents and property in danger. If the Bajamar resort is perceived as a risky investment, investors will be hesitant to continue to purchase property in the area.

Chevron-Texaco's proposed terminal would damage tours to the Coronado Islands

The LNG terminal proposed by Chevron-Texaco would compromise critical marine bird habitat and greatly damage the tourist appeal of the Coronado Islands. The islands provide a prime habitat for a threatened species of marine bird, the Xantus Murrelet. This bird and its chicks are particularly sensitive to light pollution during the nesting season. The huge terminal, brilliantly lit at night, will be only 600 meters from the South Coronado Island. The Islands also offer encounters with Sea Lions, Harbor Seals, octopus, Horn Sharks, Moray Eels, Garibaldis, and purple coral for divers and nature viewers out for day trips. Chevron-Texaco's LNG terminal would be an eyesore at this beautiful site and decrease both the popularity of the Islands and the revenue that tourism to the Islands generates.

PEMEX will not gain from LNG importation

The proposed LNG terminals will not help Petroleos Mexicanos (PEMEX), the state owned energy firm, in the long term. Although the LNG regasification sites will be located in Mexico, they will be owned and operated by multinational companies. Due to legal constraints, PEMEX will be a partner of the LNG terminal developers, although PEMEX will not be a primary benefactor of income generated from the sale of the regasified LNG. In fact, PEMEX could become one of the largest customers of the multinational corporations. PEMEX hopes to purchase enough natural gas from Shell/Sempra and ChevronTexaco to be able to export it to the U.S, where demand is

Proposed LNG terminals have been rejected by communities

In both Tijuana and Rosarito, when citizens became informed about the potential dangers associated with the proposed LNG terminals, the community opposed the proposed terminals, and the developers abandoned the projects.

***In Tijuana, Marathon Oil** attempted to construct an LNG regasification site. However, the people living in that area fought against the LNG terminal because they realized that they were going to be undertaking 75 percent of the risk, for, at most, 10 percent of the natural gas. The community became educated about the dangers of the proposed LNG terminal, and rallied against the terminal when they realized the damaging environmental and health impacts it created. Faced with such strong local opposition, the federal and local governments decided to enforce the Tijuana Urban Development Plan, which had zoned the area for "low impact tourism". Marathon Oil was forced to discontinue its plans for the terminal.*

***In Rosarito, El Paso Energy and Conoco Phillips** proposed an LNG terminal that met with strong local opposition and was forced to stop its construction plans. The local citizens were angered by the proposed the location of the LNG site - near a power plant owned by Petroleos Mexicanos. The people living near the Petroleos Mexicanos power plant refused to allow an additional plant to devastate their health, neighborhoods and the environment.*

high.[17] However, it is highly unlikely that multinational corporations like Sempra/Shell and ChevronTexaco will allow PEMEX to make any significant profits on the natural gas they intend to sell to the United States. This PEMEX export concept does little to help the situation in Baja California, where energy prices are high, and many are unable to afford electrical service.

According to a recent analysis of the North American market for natural gas, PEMEX customers are also unlikely to gain financially from the importation of LNG into Mexico. Although some commentators have stated that LNG imports will reduce the cost of natural gas, recent analysis[18] of the economics of natural gas in North America indicates that LNG importation will cause essentially no natural gas price depression either locally (at point of importation) or nationally. This is not surprising since the finding basically confirms that LNG developers will not be "shooting themselves in the foot" financially by undercutting gas prices with LNG. The static North American natural gas models being used by many to show a dramatic price depression with the importation of LNG are inappropriate models because they fail to take into account the depletion of low-cost conventional natural gas in North America.

There are insufficient supplies of low-cost domestic gas left for it to remain at the margin, so higher cost unconventional gas must be drilled. The abundant, higher cost domestic sources of gas, such as conventional (small gas field), unconventional, and arctic will be the marginal source of supply—with or without LNG importation—and these higher cost supplies will set the domestic price of gas at $4.00 to $4.50/MMBtu. Because these will set the market price of gas, "injections" of imported LNG will have little or no impact on the marginal price of natural gas.

Environmental Harms in Mexico

Although both of the proposed terminals in Baja California will have a significant impact on the surrounding environment, neither Sempra/Shell nor ChevronTexaco are making any significant effort to use the best available technology to reduce or avoid these impacts by investing in alternative, clean energy sources. In fact, both projects are being pushed forward in the absence of completed scientific study of the potential impacts. Furthermore, the past practices of these companies, particularly Sempra and Shell, show that they are willing to put their profits ahead of environmental and social concerns.

Seabirds and the Coronado Islands

The Coronado Islands, located off the Baja California coast in Mexico, just below the border about 20 miles south of San Diego, will be placed in serious jeopardy by the proposed LNG regasification terminal. The Coronado Islands are uninhabited and remain largely isolated. The species that inhabit the islands have not adapted to human activity. The proposed LNG sites expose these previously isolated islands to damaging forms of human activity.

The construction and general operation of the terminal, along with the tankers supplying the terminal, will have a continuous impact on the islands. The LNG terminal will cause distinct disturbances to the globally significant species of seabirds that inhabit the Coronado Islands. There are ten species of seabirds that use the Coronado Islands as their breeding grounds. Of these ten species, seven are listed as either threatened or endangered in the U.S or Mexico. The numbers of seabirds inhabiting the Coronado Islands are significantly lower than historical numbers due to impacts from habitat degradation as well as the prevalent use of the pesticide DDT which causes harmful thinning of the birds' shells.[19] While these seabird populations are currently rebounding, the proposed LNG terminal would make it very unlikely that these seabirds would continue to increase in number.

There are a number of factors linked to the LNG terminal that could cause continued loss of seabird populations. The construction of the terminal would introduce previously unknown sounds and sights to the islands. Surface nesting seabirds, such as the Brown Pelican, Double-crested, Brandt's, and Pelagic Cormorants, flee their nests when they are disturbed, leaving eggs unprotected. These vulnerable eggs are then susceptible to gull predation. A study conducted by Anderson and Keitt (1980) showed that 80 percent or more of eggs are lost due to human disturbances and the gull predation that follows.[20] The construction of the LNG terminal, and the subsequent operation of the terminal, would result in a severe threat to the already-endangered Brown Pelican, and would drastically reduce the populations of the Double-crested, Brandt's and Pelagic Cormorants.

Another category of seabird that inhabits the Coronado Islands is nocturnal seabirds. The Coronado Islands are at least 8 miles from any sources of light pollution, ensuring a proper nocturnal period for the seabirds that have evolved to be active only during the nighttime in order to avoid predators. The LNG terminal will require extensive lighting for safety purposes. The required lighting threatens nocturnal seabirds in two distinct ways. First, the lighting increases the risk of predation to nocturnal seabirds by illuminating their habitat during their active hours. Two types of seabirds, auks and storm petrels, breed only at night. The light pollution caused by the LNG terminal will disturb the breeding process while simultaneously exposing the active seabirds to predatory gulls and falcons. Seabirds are attracted to light. Mortality rates will increase as birds fly into lights and structures surrounding the lights.[21]

The Xantus's Murrelet is especially threatened by the light pollution that will be introduced to the Coronado Islands if the LNG terminal is built. This species is important to protect because of reduced population numbers. The Xantus Murrelet was listed as threatened by the California Department of Fish and Game in February 2004. This bird is extremely light sensitive. The world's largest population of this endangered seabird gathers in the nearshore waters of the Coronado Islands from January through July.[22]

A Potential threat to migrating whale populations

The LNG tankers will also impact the marine life in the ocean surrounding the LNG regasification site. The waters off the coast of Baja California are particularly important to the gray whale population, which returns to the Baja California waters each year to reproduce.

The potential harms to the gray whale population from the proposed regasification site at Baja California have not yet been formally studied, although two studies are in the preliminary stages. ChevronTexaco has recently commissioned a study by the Hubbs Sea World Research Institute and Shell has commissioned a study by the Center for Scientific Research and Advanced Study (CICESE) located in Ensenada, Mexico.

Past research demonstrates that the two most significant threats to the gray whale population are pollution and the disturbance of calving lagoons. The LNG regasification site at the Coronado Islands will sit directly in the middle of the migration path that gray whales follow each spring.

While the specific impact of the LNG tankers is unknown, the massive size of the tankers, coupled with the frequency of their visits, is certain to increase the threat to the gray whale population. A peer-reviewed scientific study showing that construction and operation of the LNG terminals would have a minimal impact on ocean life, particularly the gray whale population, must be conducted and disclosed before construction begins.

Unnecessary seawater use at terminals will impair marine ecosystems

The LNG terminal requires the intake, disinfection, and discharge of between 100 and 200 million gallons of chlorinated seawater per day. Chlorinated seawater is toxic to marine life, effecting the processes of reproduction, feeding, and respiration. It can also cause mutagenic effects.[23] The cold temperatures at which the water is discharged, as much as 20 degrees colder than the ocean's water, amplify the negative impacts of toxic, chlorinated seawater.[24]

The immediate impacts of discharging chlorinated water into the ocean are significant. Chlorine does not dissolve, but rather breaks down and forms complexes with other substances to create chlorinated organics. Chlorinated organics remain toxic to marine life forms for extended period of time.

The Clean Water Act requires the use of "the best technology available for minimizing adverse environmental impact" of LNG terminals within the borders of the United States. Submerged combustion vaporization (SCV) is the least environmentally damaging technology available for regasification. It uses less than two percent of the natural gas to vaporize the LNG. Although use of SCV results in a slight increase in terminal air emissions, these emissions can be substantially reduced by employing selective catalytic reduction (SCR) for nitrogen oxide control. SCR is used to control nitrogen oxide emissions from the SCV system in use at the oldest LNG regasification terminal in the

United States, Distrigas LNG in Boston.[25] Mexico is not governed by the Clean Water Act, and the LNG sites in Baja California will use less sophisticated, and much more environmentally devastating, regasification technology.

Pipeline construction by Sempra Energy has damaged ancient artifacts

Costa Azul is the only remaining undisturbed stretch of coastline between Tijuana and Ensenada. The site has a rich history of habitation by indigenous peoples, extending back over 10,000 years. The Mexican government has zoned the Costa Azul area for low-impact tourism, and recognized that "this area, with its magnificent coastal landscapes, its rare and well-preserved biological and coastal resources, its strategic location along the most scenic part of the tourist corridor, should be preserved as a state park or preserve for all Baja Californians, generating sustainable employment through ecotourism and related services, long-term excavations, and park management."[26]

Unfortunately, the current plans for developing an energy market in Baja California do not consider the value of the undisturbed coastline or the archeological significance of Costa Azul in particular. Instead, some of the environmental damage associated with the LNG terminals has already been done. The proposed terminals at both sites will connect with the Bajanorte Gas Pipeline, which extends 130 miles from Tijuana to Mexicali and on to the U.S and was completed in 2002. Sempra Energy's subsidiary, Gasoducto Bajanorte, cleared an 80-foot wide right-of-way along the entire length of the pipeline route.[27]

Although the path of the pipeline passed through a federally protected indigenous art site, Sempra made no attempt to get the necessary permits or take any steps to protect the invaluable artifacts. They were finally stopped by the efforts of Mexico's National Institute of Anthropology and History. Although Sempra eventually changed the path of the pipeline, they left a disastrous trail of irreparable damage in their wake. The clearing of the right-of-way led to the destruction of hundreds of oak and pinyon trees and their habitats. Bedrock mortars, grinding slicks, ancient encampments and potential archaeological sites were also destroyed. When the company agreed to alter their path to avoid the federally protected Vallecitos Archaelogical site, they did not repair, replant or make any attempt to mitigate the damages the clearing had caused. This complete disregard for the value of the local culture and habitat to maintain the construction schedule bodes ill for the environment in the vicinity of the proposed LNG project.[28]

Construction by Sempra/Shell will destroy more artifacts

The National Institute for History and Anthropology (INAH) was commissioned to carry out an investigation of the potential impacts of the Sempra/Shell LNG terminal on the archeological remains at the site. After one season in the field collecting and compiling information, the archeologists working for INAH produced a report on their findings. This report established the urgent need to take measures preventing irreversible loss, which can contribute to the historical understanding of the Baja California peninsula.

Their findings indicate that construction of the proposed liquid natural gas plant, including the access road and a large portion of the plant, will destroy artifacts and evidence of people that lived in Baja California thousands of years ago.

The current plan is to excavate the artifacts and human remains at the site before construction begins. The work will be primarily one of archeological rescue and preservation. The time frame of the work is currently dictated not by the needs of the project, but by the construction schedule set by Sempra/Shell.

Based on studies carried out in areas near the proposed gas processing facility, archeologists think there is a possibility that there are graves on the site. The archeologists want to study those remains for clues to the nutrition and marine economy of the humans that lived here thousands of years ago, but they fear that most of the artifacts will be destroyed in a rush to construct the plant.

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Chapter 4. Liquid Natural Gas: Derailing California's Golden Dream

California is currently engaged in a fight for its energy future. The majority of California voters, along with Greenpeace, are demanding clean renewable resources. On the other side, multinational corporations are arguing that the State should invest billions in new LNG facilities and polluting power plants, including plants that would be sited in Mexico but supply California's market.

Shell, Sempra, Chevron-Texaco and BHP corporations are pressuring California to postpone its renewable energy goals, goals that are supported overwhelmingly by California voters. Instead, these energy giants propose the purchase of foreign supplies of natural gas in the form of LNG. In addition to the influence of the big corporations, all of California's natural gas utilities either have or until recently had, a direct stake in the importation of LNG.[7]

Greenpeace is part of a larger coalition of environmental groups and community activists in California that is advocating for increased investment in renewable energy and energy efficiency in California, instead of the creation of long-term dependence on liquid natural gas facilities.

California can meet its future energy demands without building any LNG terminals. If the State pursues aggressive energy efficiency goals, retrofits the old inefficient coastal power plants, and expands the States renewable energy goals, the State can reduce natural gas demand by the equivalent of three LNG terminals.

Conservation and renewable energy are California's top priority

In 2002 the California Assembly overwhelmingly voted to make California a national renewable energy leader. California's Renewable Portfolio Standard ensures that 20 percent of California's energy will be produced from clean energy like wind, solar and geothermal by 2017. New legislation has been introduced, pushed by Governor Schwarzenegger, which would accelerate the target date to 2010.

In the same year, the California Power Authority (CPA) sent its Energy Resource Investment Plan to the state legislature. The Energy Resource Investment Plan details a strategy to prevent a future energy crisis by meeting California's energy supply shortfalls through energy efficiency, conservation and renewable generation. In total, the CPA will generate $5 billion in revenue bond financing that will leverage over $12 billion in clean energy investment by 2007.

In addition, the State's Energy Action Plan, adopted in 2003 by the California Public Utilities Commission, the California Energy Commission and the CPA, places energy efficiency and the acceleration of the State's renewable energy goal as the first priority for the State.

California can eliminate the need for three LNG facilities

Natural gas demand in California can be cost-effectively reduced by one third, through conservation and renewable energy,[2] reducing CO_2 emissions by 101 billion pounds per year. This reduction is equal to removing more than 10 million passenger cars per year from the road[3] and provides the same benefits as building three LNG terminals.

This transition to renewable energy is especially important as decisions made now impact the future of energy production. If the LNG infrastructure is built on the West Coast, California and Baja California will become increasingly dependent on natural gas and a valuable opportunity to switch to a cleaner, safer, more sustainable method of energy production will be significantly delayed, or lost altogether.

California already has a plan for reducing natural gas consumption by one-quarter

Numerous studies on the potential for energy efficiency and renewable energy were conducted when the State was putting together its Energy Action Plan. The fundamental result of these studies is a consensus that the state can significantly reduce its natural gas use through increased investments in energy efficiency and renewable power while saving money and improving the environment.

The studies by the California Energy Commission and others show that the State can reduce its natural gas use by nearly 1,500 mmcfd or roughly 25 percent through cost-effective energy efficiency measures and by accelerating investments in renewable energy. Further increasing the State renewable energy goals to 30 percent of the State's energy use by 2017 would reduce natural gas use by the equivalent of another LNG terminal (see Table 1).

Table 1: Extending California's renewable energy goal to 30 percent by 2017 would allow the State to cut natural demand by one-third.

Gas Demand, Projected Demand Increase by California Natural Gas Utilities, Supply/Demand Reduction Options	Gas Quantity, (mmcfd)
Average daily natural gas use in California, 2001	6,600
Projected increase in gas demand over 2002 baseline, 2006-2016	0-200[4]
Average projected daily natural gas delivery from one LNG terminal	700-800
Total Reduction in California gas demand from conservation measures a accelerated renewable portfolio standard (20% by 2010)	1,100 – 1,500[5]
Total Reductions assuming 30 percent renewable portfolio standard (a)	1,800 – 2,300[6]

Source: Synapse Energy Economics, 2004
(a) Estimated from CEC baseline.

Increased Energy Efficiency Investments

The largest single consumer of natural gas in California is the electric power industry, accounting for roughly one-third of the natural gas use in the state. Consequently, one of the best ways to reduce California's natural gas demand is to reduce the need for electricity through accelerated energy efficiency programs.

Studies by the California Energy Commission and an Xenergy Inc. consultants report commissioned by the Energy Foundation and Hewlett Foundation[7] found that over the next decade there is a significant potential for energy-efficiency savings in California. The CEC found that increased investments in energy efficiency could save 30,000 gigawatt hours (gwh) of electricity, which would reduce natural gas consumption in the state by 550 mmcfd over the CEC base case forecast.[8] Similarly, Xenergy found that even more cost-effective energy efficiency measures can be implemented – saving 40,000 gwh of electricity – that would equal 820 mmcfd of natural gas savings over the CEC base forecast. The baseload throughput of one LNG terminal is approximately 700 mmcf/d.

Building Standards

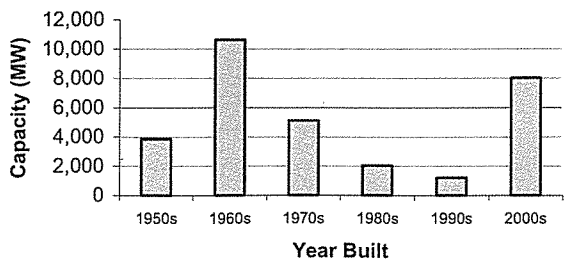
More efficient technology is available at the consumer level. Recently adopted 2005 building standards will provide a 10 percent improvement over the 2001 standard. They are expected to produce annual electricity savings of nearly 5,000 gwh, which translates into 130 mmfcd of natural gas reductions by 2016.[9] Improved appliance standards also are expected to provide significant additional savings.

Improving the efficiency of coastal natural gas power plants

The State can take a giant step forward in energy efficiency by upgrading the old coastal utility boiler plants. Most of these units were built before 1975 and consume at least 50 percent more natural gas per unit of electricity produced than a new power plant. There are approximately 16,600 MW of old generating capacity in California.[10] Upgrading just the older non-peaking plants in California with newer technology would save approximately 500 mmcf/d.[11]

There are also significant health and economic benefits to replacing these aging power plants. Newer plants have lower fuel and operating costs, and produce less smog-forming nitrogen oxide emissions. Water usage from inefficient cooling could also be dramatically reduced with more efficient processes, which can be critical in mitigating the harm to

Figure 1. Most of the natural gas power plants in California were built before 1980



aquatic ecosystems. According to the California Energy Commission, all of the natural gas power plants built in this decade, 8,000 MW of power plants, have a nitrogen oxide limit of 5 ppm or less. However, over 10 percent of the older natural gas plants are permitted to emit over 50 ppm and another 12 percent can emit between 15 and 50 ppm (see Figure 1).[12]

Renewable energy is the key to reducing natural gas use in the state.

An accelerated Renewable Portfolio Standard (RPS)[13] is another key to significantly reducing natural gas use in the State. The RPS, adopted by California voters in 2002, currently states that 20 percent of energy generation in California should be from renewable sources of electricity by 2017. This represents a doubling of the renewable energy production from 2001.

Table 2: Energy Efficiency and a 30 percent RPS will reduce the need for three LNG terminals in California

Supply/Demand Reduction Options	Gas Savings (mmcfd)
Increased Investments in Energy Efficiency Programs	550 – 820
Newly Implemented Building Standards	80 – 130
Improved Efficiency of Old Natural Gas Power Plants	475
Accelerated Renewable Portfolio Standard to 20 percent by 2010	27 – 55
Renewable Portfolio Standard 30 percent by 2017 (a)	685 – 820
Total Natural Gas Demand Savings	1,800 – 2,300

Source: Synapse Energy Economics, 2004
(a) Estimated from CEC baseline.

New legislation has been introduced, endorsed by the new Governor Arnold Schwarzenegger, which would accelerate the target date to 2010. This change would offset 220 mmcfd of natural gas use in 2010, falling to 55 mmcfd in 2013 as compared with the current RPS.[14]

Policy makers and environmentalists are calling on the State to continue to pursue aggressive renewable energy targets. An increase the RPS to 30 percent by 2017 would represent a significant increase in energy production and further reduces the demand for natural gas in the state. A 30 percent renewable energy goal by 2017 would reduce natural gas demand by an additional 685 to 820 mmcfd, the equivalent of one LNG terminal.

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[1] Southern California Gas and San Diego Gas and Electric are owned by Sempra. Until recently PGE owned the U.S. extension of the North Baja Pipeline in partnership with Sempra.
[2] Synapse report and assuming renewable energy goal of 30 percent by 2017.

[3] Environmental Protection Agency (assumes auto emissions of 10,000 pounds of CO_2 per year).
[4] Derived from presentations by PGE, SoCalGas, and SDGE at CEC/CPUC Natural Gas Workshop, Dec. 9-10, 2003.
[5] Derived from Synapse Energy Economics evaluation submitted in March 23, 2004 RACE coalition comments in CPUC Utility Long-Term Natural Gas Procurement Proceeding, Rulemaking 04-01-25
[6] Ibid
[7] Xenergy, 2002, California's Secret Energy Surplus, the Potential for Energy Efficiency"
[8] The CEC assumed 10,000 gwh of energy efficiency savings.
[9] Energy Action Plan Legislative Report, dated January 5, 2004.
[10] "Aging Natural Gas Power Plants in California." *California Energy Commission Staff Paper*, July 2003.
[11] Synapse Energy Economics on the California Natural Gas Utilities' Phase 1 Proposals, March 23, 2004.
[12] California Energy Commission, Aging Natural Gas Power Plants in California, July 2003.
[13] "Proposed Energy Savings Goals for Energy Efficiency Programs in California." *California Energy Commission Staff Report,* dated October 27, 2003, pg 32.
[14] *Renewable Resources Development Report*, a Presentation by Ann Peterson, Project Manager, at the California Energy Commission Business Meeting, November 19, 2003, assuming 8,000 Ghw increase.

Chapter 5. LNG's Global Blood Trail

Liquid natural gas production results in environmental damage and human rights violations around the world. The natural gas used to make LNG destined for Mexico will be mined for in some of the world's most sensitive environments, such as the Peruvian jungle and Sakhalin Island in the Russian Far East. The world's banks are poised to finance these destructive practices around the globe.

Government Overthrow in Bolivia

Plans by Sempra Energy to export Bolivian gas to Chile for liquefaction and shipment to California fueled a popular uprising that left 65 dead and forced President Sanchez de Lozada from power. The revolt began in September of 2003, when indigenous and workers' groups began protests, strikes and roadblocks against the government's plan to export natural gas to the United States and Mexico via Chile. The demonstrations against the natural gas project subsequently spiraled into widespread protests against the Bolivian government. The opposition to the project has been particularly strong because many Bolivians are against exporting natural gas through a Chilean port. Bolivia lost access to the ocean in 1883 after being defeated by Chile in the War of the Pacific.

Bringing Disease and Destruction: The Camisea Project in Peru

The Camisea Gas Project in Peru is located in previously inaccessible Peruvian jungle in one of the most biologically diverse areas in the world. The project is also located in the Nahua Kugapakori State Reserve neighboring the Urubamba River, which was created over a decade ago to protect vulnerable native cultures. These nomadic, indigenous communities have had little or no contact with the outside world. In spite of the protected status of this land, Phase I of the Camisea Gas project will be completed in August 2004. This project is highly controversial due to the extensive environmental damage and the impact on indigenous peoples caused during the construction of the gas wells, gas plant, and 700-kilometer pipeline from the jungle to the coast.

Companies involved in the Camisea project consortium include Hunt Oil, Halliburton, Argentina's PlusPetrol and Techint, and Belgium's Tractebel. The consortium has been fined by the Peruvian government for violating erosion control and water quality standards. The pipeline right-of-way passes through many kilometers of steep jungle terrain with unstable soils and has been completely exposed for two consecutive rainy seasons. The failure of the consortium to promptly replant and close the pipeline right-of-way has resulted in tremendous erosion, landslides, and water quality impacts in the jungle portion of the project. This failure has also opened the region to "invasion" by outside colonists, further degrading this sensitive environment and threatening the health and way-of-life of the indigenous inhabitants.

Hunt Oil will be responsible for Phase II of the project, the construction of a liquefied natural gas (LNG) liquefaction terminal on the Peruvian coast south of Lima. The target markets for this LNG are California and Mexico. While Hunt Oil and the other companies involved stand to make a substantial profit from LNG, the cost to the Machiguenga indigenous communities in the Camisea region is a decline in health, attributed to pollution and the invasion of construction, and the potential loss of their culture.

The indigenous cultures living in the Nahua Kugapakori State Reserve are in the initial stages of contact with the outside world. One of their early communications with the outside world was an expression of outrage at the invasion of the oil companies; "In the past, Shell worked here and almost all of us died from the diseases...We know that if another company comes here, our rivers and land will be destroyed. What will we eat when the rivers are dead and the animals have run away?"[1]

Endangering the Whales: Russia's Sakhalin Island[2]

Sakhalin is a Russian island that is located about 50 miles north of Japan. After the collapse of the Soviet Union in the early 1990's, multi-national oil and gas companies wasted little time in exploring the waters around the island for oil and gas. It is now one of the leading oil and gas producing regions in Russia, and almost all of what is being produced is for the export market.

Natural gas is a by-product of the crude oil that is being extracted from Sakhalin. Despite industry claims to the contrary, getting natural gas from beneath the ocean floor has proven to be a dirty and dangerous process. Sakhalin's oil and gas is being drilled from two huge off-shore oil platforms, one operated primarily by ExxonMobil (the Sakhalin I project), and the other primarily by Shell and Mitsubishi (the Sakhalin II project). Sakhalin II would be a potential supplier of the Shell/Sempra import terminal at Costa Azul in Baja California.

Both of these platforms are located in a pristine marine habitat, and can potentially impact the only feeding ground of the critically endangered Western Pacific Gray Whale. There are about only 100 of these magnificent creatures alive, and the health of the surviving whales is being seriously compromised. Scientists studying the whales have observed malnourished, or "skinny," whales in the area. These scientists are concerned that continued oil and gas drilling adjacent to whale habitat, tanker traffic, and underwater pipeline construction could push the last of this dying breed into extinction.

For the next phase of the Sakhalin II project, Shell wants to build massive infrastructure to get the oil and gas to markets abroad. This will involve laying underwater oil and gas pipelines that will run right through whale feeding habitat, as well as through the home of many other species of fish, and on to the shores of Sakhalin. Environmentalists and local fishermen are very concerned that the construction of these pipelines could seriously disrupt this habitat, and that the pipeline could leak and contaminate the waters.

Once on the island, the oil and gas would be sent through parallel pipelines that will run the length of Sakhalin Island, over 800 kilometers, to its southern tip. Along its route, the pipeline will cross over 1,000 streams and rivers. Hundreds of these waterways provide spawning grounds for wild salmon, and together they contribute to one of the most robust salmon habitats in the world. The pipeline crossings will gouge right through the beds of these streams, with very little concern given to the well-being of the salmon, or the local economy and community that depends on the salmon for a substantial part of their diet.

The Sakhalin II project is dependent upon the public's money for its construction. The U.S. Export-Import Bank, and the European Bank for Reconstruction and Development are currently considering financing the further development of the Sakhalin II project, including the gas pipeline and the regasification terminal.

Jepordizing Biodiversity: Australia's Barrow Island[3]

ChevronTexaco, ExxonMobil and Shell are currently proposing to put over $6 billion worth of industrial gas processing facility and equipment on Barrow Island in a development known as the Gorgon Project. This infrastructure, which includes an LNG liquefaction plant, could be located offshore, on the mainland or on less important islands nearby.

Barrow Island is Western Australia's second largest island and home to internationally significant biodiversity. If no concerted effort to regulate human access and activities on the island is made, the unique biodiversity of the island will be jeopardized or lost forever.

There are 24 known indigenous animal species or subspecies that exist only on Barrow Island. This exceptional assemblage includes five forms of mammals, two types of reptiles, one species of bird and sixteen species of invertebrates. The island is also a refuge for the magnificent Perentie that, at lengths of over six feet, is the world's second largest lizard.

Barrow Island is such an important habitat for unique species that it is referred to as "Australia's Ark". A large construction workforce will soon invade this important habitat in order to build the proposed facilities. The estimated 52,037 personnel movements per year that will be required to build the new facilities is a manifold increase in the level of human industrial activity presently occurring on Barrow Island. This activity is one of the central threats posed to the 24 known types of animals that live nowhere else but Barrow Island. Increased human activities on the island increase the risk of the introduction of weeds and diseases that could wipe out the island's biological diversity forever.

Presently, only 150 barge movements occur per year and only 150 people live on Barrow Island at any one time. The number of visitors to the island is carefully controlled based on Barrow Islands status as a Permanent Class A Reserve. Yet, even this relatively low level of activity has led to the introduction of eight known species of environmental weeds, four of which have been impossible to eradicate. In recent years it has also been necessary to implement eradication programmes for black rats, house mice, and European bees.

The Gorgon proposal estimates that 861 barge movements and 52,307 personnel movements per year will be required to build the new facilities. The Australian Northwest Territory State Environmental Protection Authority (EPA) warns that temporary contractors will do the majority of this work. This transitory work force will increase the risk of introducing foreign weeds, pests and diseases to the degree that the EPA considers "virtually certain".

A Traditional Way of Life at Risk: BP's Tangguh Project in Indonesia

BP has proposed an LNG exploitation site at the Berau and Bituni Bays, which are located in the Indonesian province, Papua. The project, named the Tangguh (which translates to all-powerful in Indonesian) project by BP, requires the construction of two offshore gas platforms, a 2,000 meter long and 150 meter wide airfield and an LNG plant that will cover 600 hectares of what is now rainforest.[4] The massive construction required to operate BP's plant is having a significant impact on the local populations.

Bituni Bay is a fishing community. Fishing and shrimping account for US$13 million/year. Many fisher folk, both male and female, have taken jobs with BP. However, the effects of BP's construction threaten those that are not fortunate enough to claim one of the limited available positions of employment. The seismic testing performed in the waters south of Bituni Bay has impacted fishing and reduced revenues for the local fisher folk. Additionally, large fields of Mangrove have been cut to clear the way for the construction, resulting in large stacks of logs that disrupt local fisheries.

As the mangroves are cut down to create space for the new LNG plant, the mangrove ecosystem is disrupted. Mangroves are a major source of revenue, generating over US$10 million per year. The mangrove ecosystem is already under pressure from the wood chip exporting industry.

While many community members view the Tangguh project as an opportunity, citing BP estimates that 5,000 temporary construction jobs will be created with about 10 percent of those jobs being permanent, many citizens are angry about the lifestyle changes that the Tangguh project will force on them. The Economist reported that all information supplied to the villagers came from BP, NGO's paid for by BP, or the Indonesian government, which stands to profit from the site. If the villagers were informed of the potential safety and environmental harms associated with the site, they may be less captivated by the promise of a comparatively small number of jobs.

The Papua province is in a state of extreme unrest as it seeks independence from Indonesia. Local conflicts and investigations into human right's abuses made the area too volatile for Exxon Mobil to operate in nearby Aceh, another province seeking independence from Indonesia. Developing a natural gas exploitation site in this conflict stricken community may cause additional problems in the area. In addition, if BP is forced to close its LNG site due to safety concerns resulting from the conflict, the California market that it supplies will suffer a lack of supply[5]. The impacts of that drastic reduction in supply could be reminiscent of the previous energy crisis.

[1] Available from www.amazonwatch.org
[2] Available from www.pacificenvironment.org .
[3] Availiable from www.rescuebarrowisland.org.au/
[4] Mining Advocacy Network. *Kerebok* Volume 3 Number 27 October 2002 http://www.jatam.org/english/case/bt/uploaded/not_power.html
[5] JATAM- Mining Advocacy Network, "From Persia to Papua: Tracking the Perils of BP's Mining, Oil and Gas Operations Around the World" January 2003.

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